CLAIMS

1. Communication apparatus, comprising:

a packet network interface, for coupling to a packet switch in a packet network;

a telephone network interface, for coupling to a node in a circuit-switched telephone network; and

a convergence processor, coupled between the packet network and telephone network interfaces and adapted to emulate a mobile switching center (MSC) and a visitor location register (VLR) in the circuit-switched telephone network so as to assign telephone numbers in the circuit-switched telephone network to user terminals in the packet network and to connect telephone calls, using the assigned telephone numbers, between telephones in the circuit-switched network and the user terminals.

2. The apparatus according to claim 1, wherein the packet network comprises an Internet Protocol (IP) network, and wherein the telephone network comprises a cellular telephone network.

3. The apparatus according to claim 2, wherein the convergence processor is adapted to assign different, first and second telephone numbers to a given user terminal in the packet network, wherein the first telephone number belongs to the cellular telephone network, and the second telephone number belongs to a public switched telephone network (PSTN).

4. The apparatus according to claim 1, wherein the convergence processor is adapted to assign to the user terminals telephone numbers having a first country code, while the user terminals are located in a country having a different, second country code.

5. The apparatus according to claim 1, wherein the packet network interface comprises a session border controller, which is operative to perform Network Address Translation (NAT).

6. The apparatus according to claim 1, wherein the telephone network interface comprises a media gateway.

7. The apparatus according to claim 1, and comprising a softswitch, which is coupled between the packet network and telephone network interfaces and the convergence processor so as to convey instructions from the convergence processor to the packet network and telephone network interfaces regarding handling of the telephone calls to and from the user terminals.

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8.   The apparatus according to claim 7, wherein the softswitch is adapted to communicate with the packet network and telephone network interfaces by transmitting and receiving at least one of Session Initiation Protocol (SIP) or and SIP for telephones (SIP-T) packets.

9.   The apparatus according to any of the preceding claims, wherein the convergence processor is adapted to receive registration requests from the user terminals and, in response to the registration requests, to register the user terminals in a home location register (HLR) in the telephone network.

10.   The apparatus according to claim 9, wherein the convergence processor is adapted to communicate with the HLR in order to determine respective service profiles applicable to the user terminals.

11.   The apparatus according to claim 10, wherein the convergence processor is adapted, responsively to the service profile, to invoke an Intelligent Network (IN) service in the telephone network that is to be applied to a call.

12.   The apparatus according to claim 10, wherein the convergence processor is adapted to determine the respective service profiles initially upon registration of the user terminals and to update one or more of the service profiles thereafter while the user terminals are in operation.

13.   The apparatus according to claim 10, wherein the convergence processor is adapted to receive from the packet network interface an indication of a request from one of the user terminals to set up a call, and responsively to the indication, to cause the telephone network interface to route the call to a telephone number in the telephone network in accordance with an applicable service profile.

14.   The apparatus according to claim 9, wherein the convergence processor is adapted to receive a request from the HLR for routing information with respect to a call placed from the telephone network to a telephone number that is assigned to a user terminal having a network address in the packet network and, responsively to the request, to cause the packet network interface to route the call to the network address of the user terminal.

15.   The apparatus according to claim 9, wherein the convergence processor is adapted to communicate with the HLR using a Mobile Application Protocol (MAP).

16.   A method for communication, comprising:

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coupling a convergence processor between a packet switch in a packet network and a node in a circuit-switched telephone network;

assigning telephone numbers in the circuit-switched telephone network to user terminals in the packet network; and

5   connecting telephone calls, using the assigned telephone numbers, between telephones in the circuit-switched network and the user terminals, by operating the convergence processor so as to emulate a mobile switching center (MSC) and a visitor location register (VLR) of the assigned numbers in the circuit-switched telephone network.

17.   The method according to claim 16, wherein the packet network comprises an Internet
10   Protocol (IP) network, and wherein the telephone network comprises a cellular telephone network.

18.   The method according to claim 17, assigning the telephone numbers comprises assigning different, first and second telephone numbers to a given user terminal in the packet network, wherein the first telephone number belongs to the cellular telephone network, and the
15   second telephone number belongs to a public switched telephone network (PSTN).

19.   The method according to claim 16, wherein assigning the telephone numbers comprises assigning to the user terminals telephone numbers having a first country code, while the user terminals are located in a country having a different, second country code.

20.   The method according to claim 16, wherein connecting the telephone calls comprises
20   performing Network Address Translation (NAT) so as to connect the calls to the user terminals via the packet network.

21.   The method according to claim 16, wherein connecting the telephone calls comprises converting media and signaling messages between protocols used respectively in the packet and telephone networks.

25 22.   The method according to any of claims 16-21, wherein connecting the telephone calls comprises receiving registration requests from the user terminals and, in response to the registration requests, registering the user terminals in a home location register (HLR) in the telephone network.

23.   The method according to claim 22, wherein registering the user terminals comprises communicating with the HLR in order to determine respective service profiles applicable to the user terminals.

24.   The method according to claim 23, wherein connecting the telephone calls comprises invoking, responsively to the service profile, an Intelligent Network (IN) service in the telephone network that is to be applied to a call.

25.   The method according to claim 23, wherein communicating with the HLR comprises determining the respective service profiles initially upon registration, and comprising updating one or more of the service profiles thereafter while the user terminals are in operation.

26.   The apparatus according to claim 23, wherein connecting the telephone calls comprises receiving from the packet network an indication of a request from one of the user terminals to set up a call, and responsively to the indication, routing the call to a telephone number in the telephone network in accordance with an applicable service profile.

27.   The method according to claim 22, wherein connecting the telephone calls comprises receiving a request from the HLR for routing information with respect to a call placed from the telephone network to a telephone number that is assigned to a user terminal having a network address in the packet network and, responsively to the request, routing the call to the network address of the user terminal.

28.   The method according to claim 22, wherein registering the user terminals comprises communicating with the HLR using a Mobile Application Protocol (MAP).